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ABSTRACT

Findings of a series of sociological studies on American men indicate that job conditions facilitating occupational self-direction increase men's intellectual flexibility and promote a self-directed orientation to self and society. In addition, jobs that limit occupational self-direction decrease men's intellectual flexibility and promote a conformist orientation to self and society. Environmentally complex work conditions increase adult intellectual flexibility. Part of the intellectual decrement reported in the elderly may result from the reduced complexity of their work environments. The experience of self-direction may affect intellectual flexibility differently at different stages of one's educational and occupational career. Studies assessing the relationship of parental behavior to children's intellectual flexibility may provide an instance of the causal interconnection of sociological and psychological phenomena such as social role definitions and intellectual functioning. (RH)

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A Sociological Perspective on Intellectual Development

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As will become clear shortly, for me at least, the question of exactly what is a sociological viewpoint is not a self-evident one. Upon some reflection, I settled on a series of criteria all of which apply to the research program I shall be describing. Perhaps the most gratuitous criterion, but the one with the most direct consequences, is that research that is viewed as sociological is published primarily in sociological journals and as a consequence is unlikely to become known to mainstream researchers in other disciplines, even when the findings are relevant. A more substantive characteristic of the sociological perspective is the use of sociological level phenomena such as social class or social status as independent and/or dependent variables.

A third criterion for defining a sociological approach is methodological. Although far from all sociologists share such

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methodological concerns and interests, the discipline, possibly in part because of historical accident and in part because of the nature of the phenomena being investigated, has been more concerned with the niceties of the statistical analyses of non-experimental data, than has psychology or anthropology. Such interest has led to a concern for representative sampling and to the development of sophisticated statistical techniques for use in studies where the random assignment of subjects to experimental conditions is not feasible.

The research program I will be describing has a history of well over a quarter of a century, having been started by Melvin Kohn and me around 1962. Going into historical detail about what we did and when and why we did it is not appropriate for this occasion. However, since the focus of this session is on multidisciplinary approaches, I should make it clear that in its origin and development our project was definitely influenced by disciplines other than sociology. Mel Kohn was an undergraduate psychology major. I received my PhD in Social Psychology from a standard psychology department (N.Y.U.) and consider myself both a psychologist and a sociologist. My research career is reflected in my belonging to both the Psychonomic Society and the Sociological Research Association.

The original purpose of the research that Kohn and I undertook was to test the hypothesis that differences between lower social status and higher social status parents' values for their children arise in substantial part from differences in the parents' work experience (Kohn, 1969). We hypothesized that

higher social status parents-- whose jobs tend to require self-direction and the manipulation of interpersonal relations, ideas and symbols-- would value self-directedness for their children, while lower social status parents-- whose jobs tend to require that they conform to rules and procedures established by authority-- would value conforming behavior in their children. Thus, the key for explaining the effects of social status is hypothesized to be the relatively greater degree of occupational self-direction--the use of initiative, thought, and independent judgment--required by higher status occupations.

The data on psychological and occupational functioning on which these hypotheses were first examined came from interviews conducted in 1964 with a sample of 3,101 men, representative of all men employed in civilian occupations throughout the United States (Kohn & Schooler, 1969). Many psychological measures other than parental values were included in the survey questionnaire we designed. Most important from the perspective of the present symposium was the inclusion of measures of intellectual flexibility, but we also included indices of values for self, self-conceptions, and social orientations. This permitted us to examine the relationship of work experience to many aspects of psychological functioning.

Because occupational conditions determining the level of occupational self-direction were only some of the dimensions of occupational experience that might have psychological effects, questions about the gamut of potentially effective occupational conditions were also included. As a result, we could describe

jobs in terms of more than fifty dimensions, and such dimensions of work (e.g., substantive complexity, hierarchical position, time pressure), rather than specific named occupations (e.g., lawyer, furniture upholsterer, chicken sexer), became the units of analysis.

We quickly came to feel that occupational conditions that increased the complexity of the intellectual demands placed on an individual would have the greatest potential for affecting an individual's psychological functioning. The complexity of an environment was later defined in terms of its stimulus and demand characteristics in a somewhat more formalized theory of environmental complexity (Schooler 1984, 1987). According to this definition, the more diverse the stimuli, the greater the number of decisions required, the greater the number of considerations to be taken into account in making these decisions, and the more ill defined and apparently contradictory the contingencies, the more complex the environment. We hypothesized that social-structurally determined occupational conditions that promote occupational self-direction or otherwise involve dealing with complex environments would increase intellectual flexibility, while conditions that limit occupational self-direction and environmental complexity would decrease intellectual flexibility.

Note that in contrast with many other researchers, we were hypothesizing that such intellectual development could take place in mid-life and that intellectual change was not limited to either childhood or old age. Furthermore, even from the

beginning, we were well aware that merely finding correlations between
self-directed job conditions and intellectual functioning would not be sufficient to prove our case. People could be selected into jobs, either by themselves or by their employers, on the basis of their intellectual functioning. (Much of personnel psychology is in fact dedicated to just such selection, while rarely considering the ways in which jobs may change people.) It also seems likely that people who have intellectual difficulties in carrying out their work may be subject to relatively high levels of job attrition. Furthermore, individuals' levels of intellectual functioning may affect what they do on their jobs and how they do it. Consequently, any correlation found between a job condition and intellectual flexibility may reflect a reciprocal causal connection. A causal path from person to job may come about because people fit into their jobs or perhaps mold them; a causal path from job to person may occur because people's job conditions actually affect their intellectual functioning.

Recognizing the possibility of reciprocal effects between job conditions and intellectual functioning eventually led us to linear structural equation modeling. In part because of the importance of controlling the effects of measurement error in causal analysis, we used linear structural equation based confirmatory factor analysis to develop measures for those constructs for which we had multiple indicators (Joreskog 1973; Joreskog and Sorbom 1976a, 1976b; Bentler, 1980; Schooler, 1983).

Of the more than fifty occupational dimensions included in

our study, the measures that most clearly reflect environmental conditions meeting the theoretical definition of environmental complexity are the components of occupational self-direction. These are routinization, closeness of supervision, and most important of all, the substantive complexity of work--the degree to which performance of the work demands thought and independent judgment. Because a worker must make many decisions taking into account ill-defined or apparently conflicting contingencies, substantively complex work fits the definition of environmental complexity. Substantive complexity is measured through a detailed inquiry about precisely what people do when working with data, with things, and with people. (The measurement model for occupational self-direction is presented in Fig. 1)

For the index of intellectual flexibility, the psychological variable hypothesized to be most affected by environmental complexity, a wide variety of indicators were sampled. These included men's solutions to seemingly simple but highly revealing cognitive problems involving well-known issues, their handling of perceptual tests, their propensity to agree when asked agree-disagree questions, and the impression they made on the interviewer during a long session that required a great deal of thought and reflection. None of these indicators is assumed to be completely valid; but all are assumed to reflect, in some substantial degree, men's flexibility in attempting to cope with the demands of a complex situation.1/ (The measurement model is presented in Fig. 2).

We were able to use the data from the original study to show

multiple and partial correlational relationships that seemed to support our hypotheses and even to do some preliminary causal modeling (Kohn and Schooler 1969, 1973). After a while, however, we and our critics recognized that for effective statistical modeling and evaluation of potential reciprocal causal connections between job conditions and psychological functioning, longitudinal data were necessary. The longitudinal data necessary to assess the reciprocal effects of occupational conditions and
psychological functioning more adequately were gathered through a ten year follow-up survey of a representative portion (687 men) of the original sample (for details see Kohn & Schooler 1983). The prototypic longitudinal analysis (see Fig. 3) showed that the effect on intellectual flexibility of the substantive complexity of the work done, a key component of occupational self-direction and source of environmental complexity on the job, is real and noteworthy--on the order of one fourth as great as the effect of men's earlier levels of intellectual flexibility on their present intellectual flexibility (Kohn & Schooler 1978). 2/ 3/

The causal model was expanded to consider simultaneously several structural imperatives of the job-- job conditions that are significantly related to psychological functioning, independent of education and other job conditions-- and three major dimensions of personality--intellectual flexibility, a self-directed orientation to self and society, and a sense of distress (Kohn & Schooler 1982). This analysis (see Fig. 4) also

pointed to the importance for personality of the substantive complexity of work, the job condition most directly related to the complexity of environmental demands.

Taken altogether, our findings on American men indicate that job conditions that facilitate occupational self-direction, particularly substantive complexity, increase men's intellectual flexibility and promote a self-directed orientation to self and society; jobs that limit occupational self-direction decrease men's intellectual flexibility and promote a conformist orientation to self and society. To the extent that the necessity for using initiative, thought, and independent judgment represents complex environmental demands, these findings provide strong empirical support for the hypothesis that environmental complexity on the job increases adult intellectual flexibility as well as generating a self-directed orientation to self and society. The consistency of these results implies that the principal process by which a job affects psychological functioning is one of straightforward generalization from the lessons of the job to life off-the-job, rather than such less direct processes as compensation and reaction-formation.

Other studies in the same research program strongly suggest that environmentally complex work conditions have similar effects on the intellectual functioning of other adult populations. J. Miller, Schooler, Kohn, and K. A. Miller (1979) found that occupational self-direction is related to ideational flexibility and self-directed orientations in the same way in employed

American women as in employed American men. Although longitudinal data were not available, linear structural equation analyses indicated that working in a substantively complex job increases women's intellectual flexibility, while working in a routinized job decreases it. Replications in Poland (Slomczynski, Miller, & Kohn, 1981; J. Miller, Slomczynski, & Kohn, 1985) and Japan (A. Naoi & Schooler, 1985), also using cross-sectional data, indicate that substantively complex work has the same effects on men in those countries as in the U.S.. M. Naoi and Schooler have recently replicated these findings on Japanese women.

Besides replication in different populations, there have been other forms of extension of the hypotheses about the intellectual effects of doing self-directed, substantively complex work. Substantively complex housework has been shown to affect women the same way as substantively complex work done for pay (Schooler, Kohn, K. A. Miller, & J. Miller, 1983, Chapter 10; Schooler, J. Miller, K. A. Miller, & Richtand, 1984). The demonstration of a strong positive effect of the substantive complexity of their work on the intellectuality of both men's and women's leisure-time activity (K. A. Miller & Kohn, 1983) is powerful evidence that people generalize from job experience, not only to their psychological functioning off the job, but to the actual activities they perform in their leisure time. Yet another type of generalization is implied by the finding (Schooler, 1976) that men from ethnic groups with a recent and pervasive history of serfdom tend to show the intellectual

inflexibility and conformist orientation of men working under the environmental conditions characteristic of serfdom. This tendency suggests that the restrictive social and occupational conditions that prevailed within European societies may have affected those societies' cultures in a manner analogous to the way in which the lack of occupational self-direction affects an individual's cognitions, values, and orientations.

Our research program, however, has not been limited to examining the effects of self-directed substantively complex work on intellectual functioning in mid-life. J. Miller, Slomczynski and Kohn (1985) have tested whether the effects of substantively complex work on intellectual flexibility differ as workers age. Using data from the United States and Poland, they found that in both countries the degree to which substantively complex work increases intellectual flexibility remains the same as workers grow older. What differs is the substantive complexity of the work done: in both countries older workers do less substantively complex work. Thus, leaving aside the possible effects of retirement, part of the intellectual decrement reported in the elderly may result from the reduced complexity of their work environments.

At the other end of the age range, K. A. Miller, Kohn, and Schooler (1985, 1986) have examined the processes by which students' educational experiences affect their psychological functioning. To do this, we used linear structural equations analysis on data from interviews conducted in 1974 with a subsample of the children of the respondents in the Kohn and

Schooler study of work and personality (see Fig. 5). The results suggest that educational self-direction, in particular the substantive complexity of school work, has a decided impact on students' intellectual flexibility. Even in competition with the powerful genetic and environmental effects of parental intellectual functioning and social class, measures of which were also included in the model, complex academic environments increase students' intellectual flexibility. Further analyses indicate that substantively complex school work also increases the self-directedness of students' orientations.

In addition, we found intriguing differences between our college and secondary school respondents. For secondary school students, a large proportion of the effect of educational self-direction on intellectual flexibility is direct. On the college level, however, the effect is mainly indirect, mediated by self-directedness of orientation. The effect of self-directed work among employed workers also seems to be in large part indirect (Kohn and Schooler 1983)--self-directed work leading to a self-directed orientation, which in turn leads to intellectual flexibility. The total pattern of findings suggests that the experience of self-direction may affect intellectual flexibility differently at different stages of educational and, later, occupational career. More of the effect seems to be direct at the earlier stages, when the process may be more a matter cognitive training per se; more of the effect apparently being indirect in the later stages, when the process may become less a matter of cognitive training and more a matter of taking a self-

directed approach.4/

Our earlier findings about how social-structurally determined environmental conditions affect the individual's intellectual functioning provide a ready basis for hypotheses about how parents' behaviors may be expected to affect their children's intellectual functioning. In a recent series of analyses, Carrie Schoenbach and I have examined the relationship between parents' behavior and their children's psychological functioning and values. The particular parental behaviors whose effects we examine are control (e.g. being strict, dominating, and restrictive) and support (e.g. praising, being warm, being a person to whom the child would turn when in trouble). The psychological measures we examine are self-directed orientation, distress and intellectual flexibility; the values are the ones children believe are appropriate for children of their own age. Our findings about intellectual flexibility are directly relevant to this session. If we hypothesize that parental behaviors affect children in ways similar to the ways work conditions affect those who work, it seems plausible that the effects of non-controlling parental behavior would parallel those of work conditions that encourage self-directed behavior. Thus, compared to parental behavior that affords children opportunities for self-direction, controlling parental behavior should decrease children's level of intellectual flexibility. The hypotheses about the effects of supportive parental behavior on children's intellectual functioning were less clear cut. Supportive parental behavior may give children the confidence to be self-

directed. Since self-directed orientations have been shown to lead to intellectual flexibility both in adults (Kohn and Schooler 1969) and children (Miller, Kohn and Schooler 1985, 1986), parental support may increase children's intellectual flexibility.5/

Because various research findings raise the possibility that the effects of parental behaviors may differ by sex of child, our analyses were performed separately for sons and daughters. To ensure that we are dealing with the direct effects of parental behavior, we also controlled family social stratification position as indexed by both parents' levels of education, as well as their occupational status and job incomes (if employed). The extensiveness of the data also permit the effects of a wide range of other variables that might affect the children to be controlled when evaluating the relationship between parental behavior and children's intellectual functioning (See Fig. 8) Perhaps most important, similar measures of intellectual flexibility for both parents are also included in the model. Thus, when the relationship between the child's intellectual flexibility and levels of parents' supportiveness or control are examined, not only are the effects of the child's social background and education and parents' social-stratification position taken into account, but the direct effects of both parents' intellectual flexibility are also statistically controlled. Thus, our model lets us estimate how much mothers' and fathers' behaviors directly affect their children's intellectual flexibility.

The measures of mothers' and fathers' levels of parental support and control are second-order latent variable linear structural equation factors (Joreskog and Sorbom 1976a, 1976b) based on first-order factors also developed through this method. (see Fig.6). It should be noted that each of these first-order factors includes the mother's, the father's and the child's reports about the likelihood of the particular parent showing the behavior in question as well as the correlation of the residuals of each of the respondent's ratings of father and mother on that behavior. These first order factors are then used as indicators of the second order factors of support and control. Thus the measure of a particular parent's level of control is based on that parent's, the other parent's and the child's independent estimates of how likely that parent is to lay down the law, dominate, restrict and be strict to the child (see Fig. 7). Similarly, the measure of a particular parent's level of support is based on that parent's, the other parent's and the child's independent estimates of how warm and loving that parent is, how likely the parent is to praise the child and how likely the child is to talk to or turn to that parent when troubled. In addition, our analyses indicate that fathers' supportiveness is evidenced by their laying down the law. Such concern for discipline on the father's part may actually be an indicator of his active participation in the upbringing of his son.

In assessing the relationship of parental behavior to children's intellectual flexibility, we use a latent variable linear structural equation model that postulates that parents'

behaviors are determined by their own social background and psychological characteristics and that children's psychological characteristics do not reciprocally affect their parents' psychological characteristics or behavior (See Fig. 8). Although the assumption of an absence of reciprocal effects of children on their parents seems plausible in the case of values, it seems less so for the other aspects of psychological functioning that we examine. Given the work of Bell (1968) on how the psychological characteristics of even infants can affect their parents' behavior and psychological functioning, we have to seriously accept the possibility that children's levels of intellectual flexibility might affect the way parents behave towards their children. Unfortunately, even after extensive effort, we are unable to reliably estimate such reciprocal effects models. However, we do believe that the non-reciprocal effects models that we can successfully estimate still tell us a great deal about the relationship of parents' behavior and their children's psychological functioning. They do so in a manner that permits us to examine and take into account, at a level not usually possible, how parents' background, psychological functioning and the age and sex of the child relate not only to parents' behavior, but also to the child's psychological functioning.

Our findings (See Fig. 9) reveal that daughters of controlling mothers are more intellectually flexible (standardized path = .18) and daughters of controlling fathers are less intellectually flexible (-.21) than are daughters of

non-controlling parents. Sons of controlling fathers are also less intellectually flexible (-.23) than are sons of non-controlling fathers. A lower degree of intellectual flexibility also marks the sons of supportive fathers (-.19), while the sons of supportive mothers are more intellectually flexible (.28).

We also tested the possibility that the effects of parental behavior on children's intellectual functioning might come about through some sort of interaction. For example, various theorists have suggested that a combination of strong supportiveness and firm control might be particularly advantageous. Our statistical analyses, however, revealed no suggestion of interactive effects.

The significant relationships we found between parents' behaviors and their children's intellectual flexibility provide some support for our hypotheses that parental control should decrease children's intellectual flexibility and parental support should increase children's intellectual flexibility. Many of the children of controlling parents show less intellectual flexibility-- sons and daughters of controlling fathers are less intellectually flexible than are the children of non-controlling fathers. Supportive maternal behavior is sometimes positively related to intellectual flexibility. The sons of supportive mothers are more intellectually flexible than are the sons of non-supportive ones.

It is not clear why, contrary to our expectations, the sons of supportive fathers are less intellectually flexible than are sons whose fathers are not supportive. It is conceivable that such a pattern represents a situation where the son's lack of emotional

independence from the father limits the range of his intellectual flexibility. Another possibility is that we are here seeing the result of the fathers' supportiveness of sons who have intellectual difficulties. Neither of these possibilities seems particularly convincing.

Also contrary to our expectations, the daughters of controlling mothers are more intellectually flexible (and other analyses reveal more self-directed) than are the daughters of non-controlling mothers. If we accept common stereotypes, the maternal role is seen as nurturant and supportive rather than disciplinary and controlling. It may be that when mothers act in a non-sex-stereotypic way and are controlling, they may model self-directedness for their daughters who may react as if they were in a self-directed environment, by being self-directed, as other of our analyses indicate, and intellectually flexible. If this is the case, we have an example here of the causal interconnection of sociological phenomena such as social role definitions and psychological phenomena such as intellectual functioning.

Other ongoing analyses from our research program are also relevant to the question of intellectual development. Two examples of such analyses are the exploration of how the level of occupational self-direction of parents affects their children's intellectual flexibility and the analysisof how the nature of Japanese children's school experiences affects their intellectual development. Looking over the research program as I have presented it here, both sociologists and psychologists might well

wonder whether what I have presented is really sociology or just a slightly different kind of psychology. Part of my response is that in focusing on those aspects of our work that are most directly relevant to the question at hand I have neglected work we have done examining the nature of social class or the causal interconnections between cultural, socio-economic and psychological level phenomena. More to the point, however, if we go back to the criteria for a sociological perspective with which I introduced this paper, the research I have presented is truly sociological. The papers describing it have appeared almost exclusively in sociological journals. We have been concerned with the effects of social structurally determined variables such as occupational conditions and have sought for a better understanding of such sociological level phenomena as social class and social status hierarchy. Finally, we have used statistical and sampling techniques that have characterized sociological research for a while, some of which are only now beginning to appear in psychological journals. I hope that in doing each of these things I have demonstrated that a sociological perspective does have something to contribute to the study of cognitive growth and intellectual development.

FOOTNOTES

1/ The problem of separating unreliability of measurement from real change is a critical one for causal analyses, particularly those involving longitudinal data and reciprocal effects. This is so because the magnitude of the effect of the independent variable will be underestimated in direct proportion to the amount of error in its measurement (Blalock, 1972; Heise, 1975). This is problematic for longitudinal analysis because the estimates of the stability of a variable are affected by the amount of error in the initial measure. In the analysis of reciprocal effects the problem is further exacerbated because each variable in a pair is an independent variable vis-a-vis the other.

The essence of the linear structural equation method of purging measurement error is the use of multiple indicators to make measurement models for each concept, inferring from the covariation of the indicators the degree to which each reflects the underlying concept that they all are hypothesized to reflect and the degree to which each reflects anything else, which for measurement purposes is considered to be error.

The concern over measurement error may seem querulous and academic, but the problem can be made to seem more real by comparing two numbers-- .59 and .93. Both numbers are estimates of the over-time correlation of intellectual flexibility, both are based on exactly the measures of the same individuals, over

the same ten-year time span. The estimate .59 is based on a principal component factor analysis of the same longitudinal data that the confirmatory factor analysis just presented revealed a correlation of .93 over a ten year period. Clearly, a causal analysis based on a measure containing as much measurement error as the principal component analysis based measure of intellectual flexibility seems to have would give a distorted picture of reality.

2/ The size of the path, which is .18, might not in ordinary circumstances be considered especially striking; but a continuing effect of this magnitude on so stable a phenomenon as intellectual flexibility is impressive, for the cumulative impact is much greater than the immediate effect at any one time. Continuing effects, even small-to-moderate continuing effects, on highly stable phenomena become magnified in importance.

3/ The principal component analysis used initially, and the linear structural equation measurement model which was later developed to purge measurement error, revealed the existence of two dimensions, one perceptual, the other ideational. Because of the high stability of the perceptual component and our greater theoretical interest in the ideational component, nearly all of the causal analyses were carried out with the ideational measure. Analyses using perceptual flexibility, do indicate, though, that the effect of substantively complex work on intellectual flexibility, was as strong for perceptual flexibility as for

ideational flexibility (Kohn and Schooler, 1981).

4/ A self-directed orientation may increase the effectiveness of cognitive functioning in adulthood in several different ways. One way may be by directly decreasing the rigidity and social stereotopy of the individual's cognitive responses. Such a possibility is not only strongly implied by the findings of the Kohn and Schooler research program but some such process has been suggested by several sociological theorists (Gabennesch 1972; Coser 1975). In fact, historical and cultural conditions that encourage individualistic self-directedness have been linked to cognitive flexibility and innovativeness that encourage technical and economic development (For a review see Schooler in press.).

5/ Clearly, ours is not the only research program to explore how parents' controlling and supportive behaviors affect their children. Many studies using a wide range of procedures and populations have examined this problem. Perhaps the most ambitious attempt to derive a coherent set of conclusions from this welter of disparate studies is that of Rollins and Thomas (1979). These authors systematically searched the literature published from 1960 to 1974 for empirical studies in which parental controlling behaviors alone or parental controlling and supportive behaviors were correlated with child behaviors. Categorizing these studies in terms of the direction of the reported relationships, they arrived at a series of generalizations about the relationships between parental control

and/or support and child behavior. Several of their conclusions are congruent with our own hypotheses. Among these are the generalizations that: 1) "The greater the parental support, the higher the cognitive development in children (p. 326)." 2) "The greater the parental coercion, the lower the cognitive development in children (p. 327)".

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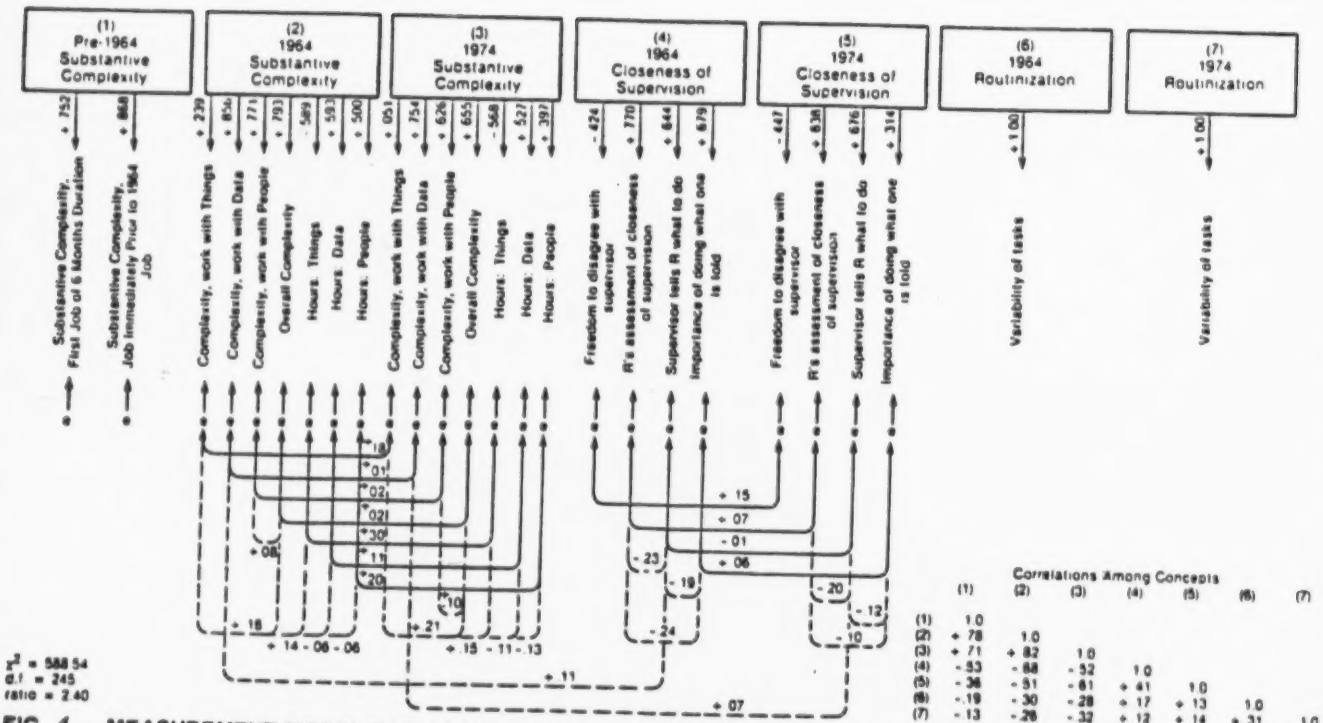
(1) Pre-1964 Substantive Complexity
(2) 1964 Substantive Complexity
(3) 1974 Substantive Complexity
(4) 1964 Closeness of Supervision
(5) 1974 Closeness of Supervision
(6) 1964 Routinization
(7) 1974 Routinization
Substantive Complexity, First Job of 6 Months Duration
Substantive Complexity, Job Immediately Prior to 1964 Job
Complexity, work with Things
Complexity, work with Data
Complexity, work with People
Overall Complexity
Hours: Things
Hours: Data
Hours: People
Freedom to disagree with supervisor
R's assessment of closeness of supervision
Supervisor tells R what to do
Importance of doing what one is told
Variability of tasks
χ^2 = 588.54
d.f. = 245
ratio = 2.40

Correlations Among Concepts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	1.0						
(2)	+ .78	1.0					
(3)	+ .71	+ .82	1.0				
(4)	- .53	- .68	- .52	1.0			
(5)	- .36	- .51	- .61	+ .41	1.0		
(6)	- .19	- .30	- .28	+ .17	+ .13	1.0	
(7)	- .13	- .26	- .32	+ .12	+ .14	+ .31	1.0

FIG. 1 MEASUREMENT MODEL FOR OCCUPATIONAL SELF-DIRECTION

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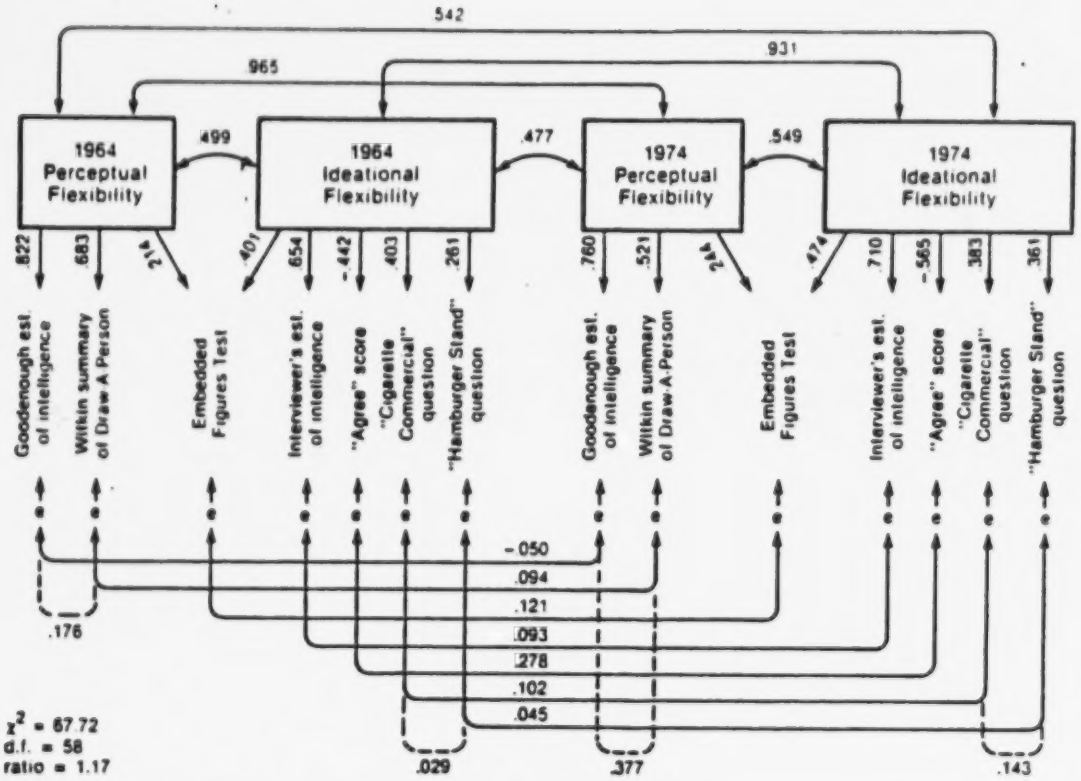
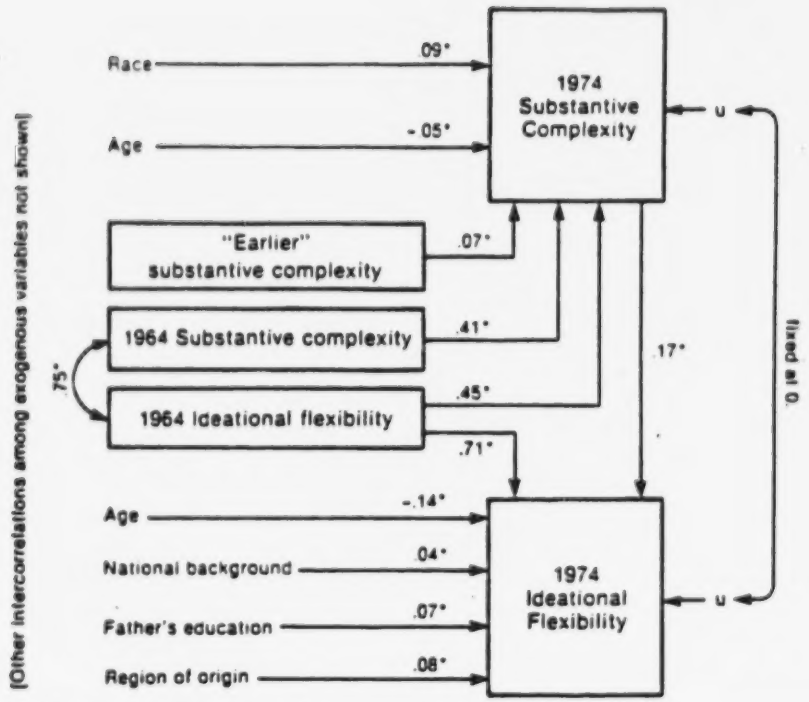


FIG. 2 MEASUREMENT MODEL FOR INTELLECTUAL FLEXIBILITY



χ^2 (for the causal model) = 11.45
d.f. = 42
ratio = 0.27
* = Statistically significant, $p \leq .05$.

FIGURE 3 RECIPROCAL EFFECTS OF SUBSTANTIVE COMPLEXITY AND IDEATIONAL FLEXIBILITY: SIGNIFICANT PATHS ONLY*

* The Path From Ideational Flexibility To Substantive Complexity is NOT Significant

FIGURE 4

THE RECIPROCAL EFFECTS OF JOB CONDITIONS, IDEATIONAL FLEXIBILITY, SELF-DIRECTEDNESS/CONFORMITY, AND DISTRESS/WELL-BEING

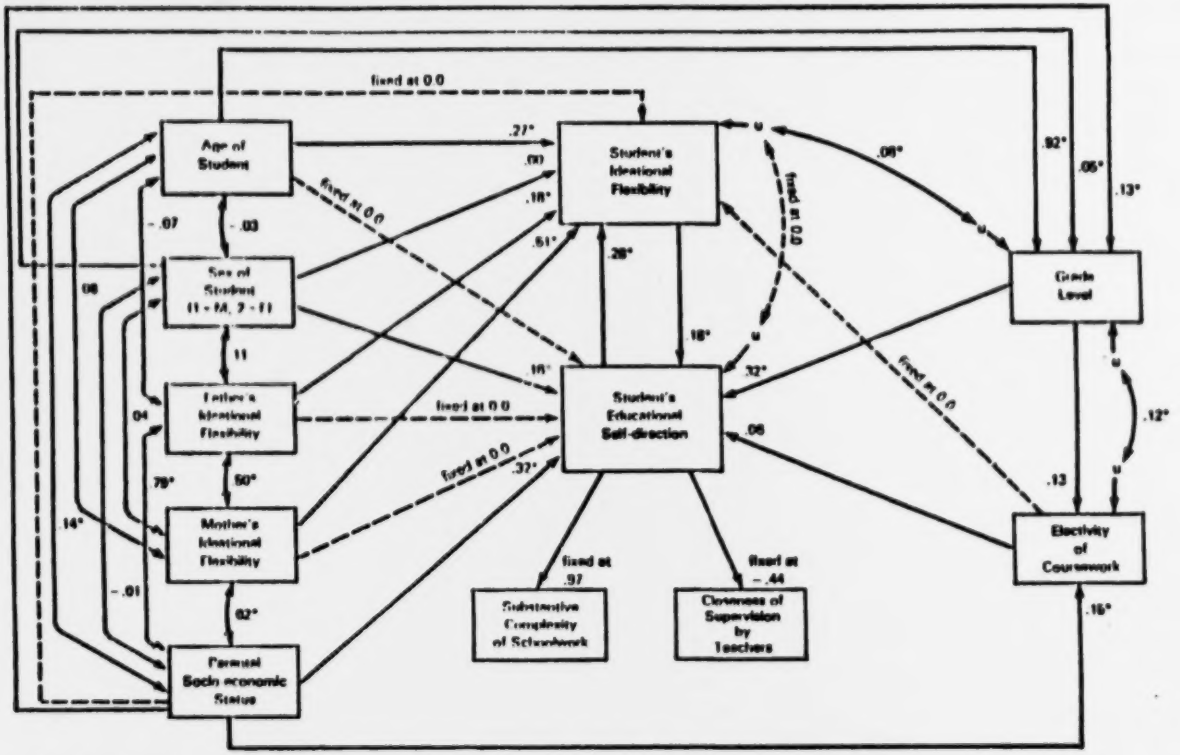
	Statistically Significant Effects of:[a]					
	Job Conditions On:			Ideational Flexibility	Self-directedness	Distress
	Ideational Flexibility	Self-directedness	Distress	On Job Conditions		
Job Conditions						
Occupational Self-direction						
Substantive complexity	.11(C)[b]	.12(C)	.0	.26(L)	.0	.0
Routinization	−.03(L)	.0	.0	.0	.0	.0
Closeness of supervision	.0[c]	.0	.09(C)	.0	−.13(L)	.0
Position in Organizational Structure						
Ownership	.0	.0	.0	.06(L)	.0	.0
Bureaucratization	.0	.0	.0	.07(L)	.0	.0
Position in hierarchy	.0	.0	−.10(L)	.0	.0	.0
Job Pressures						
Time pressure	.05(C)	.0	.0	.0	.0	.11(C)
Heaviness	−.07(C)	.0	.0	.0	−.11(L)	−.07(L)
Dirtiness	.0	.0	.10(C)	.0	.0	.0
Hours of work	.0	.0	−.08(C)	−.22(L)	.0	.0
Extrinsic Risks and Rewards						
"Held responsible"	−.04(C)	−.06(C)	.0	.0	.0	.11(C)
Risk of loss of job or business	.0	−.04(L)	.0	.0	.0	.0
Job protections	−.08(L)	−.05(C)	−.16(C)	−.14(L)	.0	.0
Job income	.07(C)	.0	.11(L)	.0	.08(L)	.0

		Statistically Significant Effects of:		
		Ideational Flexibility	Self-directedness	Distress
On:	Ideational Flexibility	.57(L)	.24(C)	.0
	Self-directedness	.13(C)	.43(L)	−.08(C)
	Distress	.0	−.25(C)	.54(L)

[a] Controlling pertinent social characteristics.

[b] (C) means a contemporaneous effect; (L) means a lagged effect.

[c] .0 means a nonsignificant effect that has subsequently been fixed at zero.



x^2 (for causal model) = 196.88; d.f. = 33; ratio = 5.97
*$p \leq .05$

Figure 5 THE RECIPROCAL EFFECTS OF EDUCATIONAL SELF-DIRECTION AND IDEATIONAL FLEXIBILITY OF STUDENTS (Paths from other pertinent social characteristics to endogenous variables not shown).

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FIGURE 6 — 1ST-ORDER PARENTAL BEHAVIOR MEASUREMENT MODELS 1/

Standardized Paths From:

To Indicators:	Warmth 2/	Praise	Talk-Turnto	Laylaw	Dominate	Strict-Restrict	
Evaluations of Mother							
by father	0.39	0.49	0.62	0.55	0.44	0.22	0.48	0.41
by mother	0.75	0.55	0.54	0.49	0.47	0.24	0.56	0.53
by child	0.48	0.50	0.66	0.66	0.56	0.76	0.61	0.61
Evaluations of Father							
by father	0.46	0.54	0.48	0.45	0.50	0.22	0.46	0.42
by mother	0.69	0.60	0.57	0.55	0.57	0.33	0.52	0.48
by child	0.48	0.56	0.66	0.68	0.42	0.91	0.67	0.59
Correlations of residuals between:							
Father's ratings of own and spouse's behavior	0.36	0.38	0.34	0.34	0.45	0.54	0.50	0.58
Mother's ratings of own and spouse's behavior	0.23	0.23	0.34	0.32	0.41	0.51	0.29	0.45
Child's ratings of each parents' behavior	0.26	0.32	0.28	0.26	0.35	0.04	0.31	0.36
χ^2/d.f.	0.90	1.80	5.69		2.14	1.08	4.41	

1/ Also included in each model was a series of parallel questions about which parent showed each of the behaviors more. Preliminary analyses indicated that these comparison measures provided no additional information.

2/ With appropriate modifications when the mother or father is asked about spouse's behavior, or child is asked about father's and mother's behavior, the full wording for each of the questions is:

Warmth: Would you say that you are very warm and loving with your child, somewhat warm and loving, not very warm and loving, or not at all warm and loving?

Praise: Would you say that you are very quick to praise your child, for things done well, somewhat quick to praise, not very quick to praise, or not at all quick to praise?

Talk-Turnto: Preliminary analysis revealed that "talk to" and "turn to" are best viewed as indicators of the same concept: a) How free does your child feel to talk things over with you, completely free, largely but not completely, moderately free, not particularly free, or not at all free? b) How likely is your child to turn to you when he/she is troubled or unhappy? Is he/she very likely, somewhat likely, not very likely, or not at all likely?

Laylaw: Would you say that you are very likely to lay down the law when your child misbehaves, somewhat likely to lay down the law, not very likely to lay down the law, or not at all likely to lay down the law?

Dominate: Would you say that you are very likely to dominate your child, somewhat likely to dominate, not very likely to dominate, or not at all likely to dominate?

Strict-Restrict: Preliminary analysis revealed that "strict" and "restrict" are best viewed as indicators of the same concept: a) Would you say that you are very strict with your child? b) How likely are you to restrict your child's freedom---very likely to restrict, somewhat likely, not very likely to restrict or not at all likely to restrict freedom?

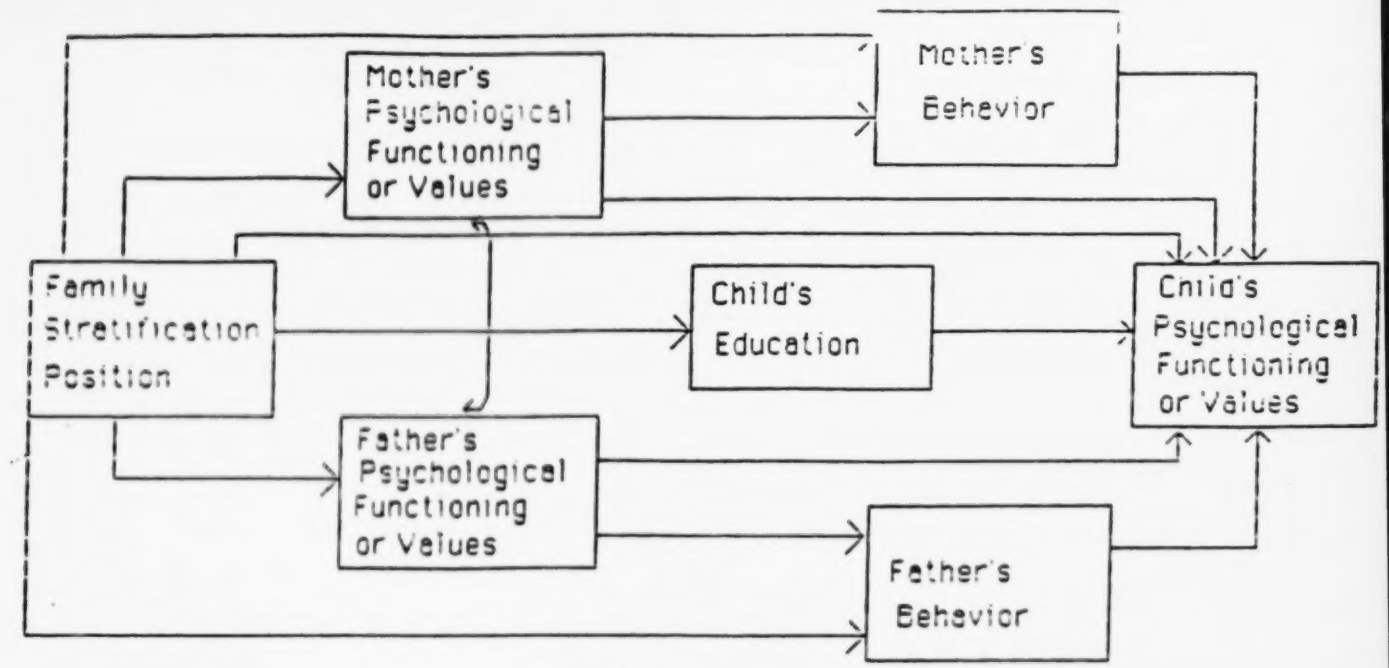
FIGURE 7

2ND-ORDER PARENTAL BEHAVIOR MEASUREMENT MODELS

Standardized Paths From:

	Mother's		Father's		Comparative	
	Support	Control	Support	Control	Support	Control
To 1st-order Concepts:						
Warm	0.68		0.76		0.67	
Praise	0.69		0.61		0.67	
Talk, turn to	0.65		0.68		0.47	
Lay down law		0.77	0.18	0.69		0.74
Dominate		0.50		0.49		0.54
Strict, restrict		0.65		0.79		0.97

$X2 = 210.94$
d.f = 101
ratio = 2.09
All parameters shown are statistically significant, $p \leq .05$.



Paths to each parent's own psychological functioning and own behavior from each parent's own age, race, national and religious backgrounds, region and urbanness of principal place raised, and socio-economic status of family of origin.

Paths to family stratification position from both husband's and wife's age, race, national and religious backgrounds, region and urbanness of principal place raised, and socio-economic status of family of origin.

Paths to child's psychological functioning and education from child's age, race, national and religious backgrounds, region and urbanness of principal place raised.

FIGURE 8 MODEL OF ANALYSIS

FIGURE 9 PARENTAL BEHAVIOR AND CHILDREN'S PSYCHOLOGICAL FUNCTIONING

	Fathers'				Mothers'			
	Control of		Support of		Control of		Support of	
	Sons	Daughters	Sons	Daughters	Sons	Daughters	Sons	Daughters
Path to Child's:								
Intellectual Flexibility	-0.23	-0.21	-0.14				0.18	0.25

* Paths are standardized. With the exception of the findings in parentheses, which are at the $p < 0.07$ level, all paths are significant at 0.05.